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Chapter 1 Newsletter

Summary of 1983-84 Evaluation Results

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Chapter 1, authorized in the Education and Consolidation Act (ECIA) of 1981, originated as ESEA Title I in 1965. The purpose of the program has remained the same over the years: to provide federal financial assistance for educationally disadvantaged students in eligible public and private schools. While Chapter 1 funds are allocated to public school districts based on low-income data, Chapter 1 services are based on educational, not economic, need. These educational services are traditionally provided in the basic skills areas of reading, language arts and math.

During the 1983-84 school year, Chapter 1 programs were operated in 355 school buildings in Montana. These programs were required to meet state and federal guidelines which include:

- o select the students most in need of academic help
- o provide individualized instruction based on diagnosis
- o evaluate student progress

FUNDING

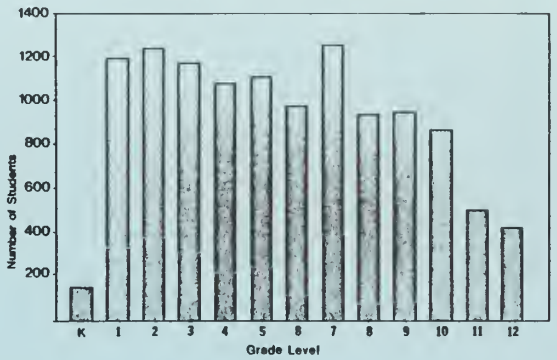
A total of $8,427,632 was budgeted by local school districts to provide Chapter 1 services during the 1983-84 school year. Of these budgeted funds, $6,161,355 were for elementary (grades K-8) programs and $2,266,277 were for high school (grades 9-12) programs. This computes to an average cost of $679 for each Chapter 1 elementary student and $842 per high school Chapter 1 student. Over 93% of all budgeted funds were expended. Of the funds expended, 91.6% went to personnel salaries and related costs. The remainder included instructional supplies, equipment, inservice training and indirect costs.

PARTICIPATION

By Grade Level

A total of 11,764 students in kindergarten through grade 12 received Chapter 1 services. Of the students served, approximately 75% were elementary students (grades K-8), with 25% being high school students. Figure 1 shows Chapter 1 participation by grade levels for the past school year.

Figure 1
1983-84 Chapter 1 Participation by Grade Level



A comparison of Montana Chapter 1 participation by grade level to the national statistics shows some interesting differences. There is proportionally greater participation in the upper grades in Montana than in the nation as a whole, as shown below. This is due, in part, to the legal configuration of Montana's schools with separate districts for grades K-8 and 9-12. This results in separate Chapter 1 allocations to the elementary and high school districts.

Chapter 1 Services	MT Students	U.S. Students
Grades K - 6	59%	76%
Grades 7 - 12	42%	24%

Montana Chapter 1 programs come in all sizes. In 1983-84 the smallest Chapter 1 program served a total of 7 students in Fallon, Montana, while the largest program served 1,088 students in Great Falls, Montana.

By Subject Area

During the 1983-84 school year, 8,473 students received Chapter 1 reading assistance; 2,133 students received Chapter 1 language arts assistance; and 4,797 students received Chapter 1 math assistance.

These results are very consistent with those of the previous four years in Montana, in which the pattern of services across subject areas is:

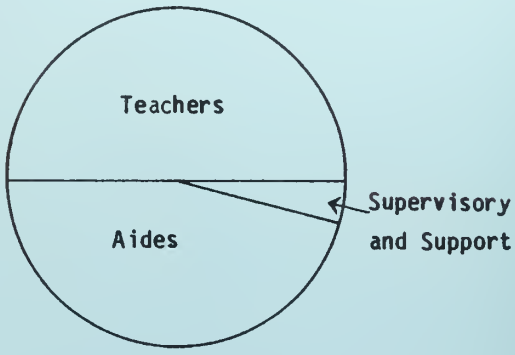
Reading	70%
Language Arts	15%
Math	40%

(Because some Chapter 1 students receive services in more than one subject area, these figures total more than 100%.) This is similar to the national picture where 78% of the Chapter 1 students receive reading assistance, 19% language arts, and 46% math.

STAFFING

Montana Chapter 1 programs had a total of 472.38 Full-Time Equivalent (FTE) employees. The actual number of employees was much higher than this, as many Montana Chapter 1 programs have part-time Chapter 1 employees. As you can see in the graph, the number of Chapter 1 FTEs is almost equally divided between certified teachers (50%) and teacher aides/tutors (46%) as shown in Figure 2. Chapter 1 instructional supervisors and support personnel (counselors, social workers and home-school coordinators) comprise remaining Chapter 1 employees. Nationally, teachers comprise a smaller proportion of Chapter 1 staff than in Montana. Curriculum specialists, support staff, and administrative staff each amount to about 3% of the total Chapter 1 FTE.

Figure 2
1983-84 Chapter 1 Staffing (FTE)



STUDENT ACHIEVEMENT

The impact of Chapter 1 programs in Montana and across the nation is measured by students' gains on standardized tests administered near the beginning (pretest) and the end (posttest) of the program. Normal curve equivalent (NCE) test scores are used to report Chapter 1 data. Any gain in NCE score greater than zero is considered better than expected growth for these students.

Montana's average NCE gains by grade level for reading and math are shown in the table below. They are presented separately for the fall/spring and annual testing schedules, because these schedules typically result in very different patterns of NCE gains.

If you wish to compare your project's NCE gains to state or national averages, be sure to select those results which match the subject matter and grade levels you serve and the testing schedule you use.

	Reading		Math	
Grade	Fall/Spring	Annual	Fall/Spring	Annual
2	9.7	10.0	13.4	15.8
3	10.6	9.6	11.6	3.2
4	8.8	4.3	10.8	3.1
5	5.8	2.6	10.2	6.6
6	4.5	6.1	10.1	4.6
7	2.2	5.4	8.8	8.9
8	3.5	8.0	7.7	2.2
9	5.4	3.5	11.1	2.9
10	4.1	-.2	6.5	7
11	5.9	4.3	4.9	16.3
12	5.1	-1.0	-.7	

The Chapter 1 evaluation information collected in Montana and across the nation over the past several years has consistently shown positive gains in virtually all grade levels and subject matters. There are important differences in the patterns of these gains. Math programs typically show greater gains than reading programs. Students in earlier grades gain more than those in later grades. Fall/spring evaluations usually result in higher NCE gains than spring/spring or fall/fall (that is, annual testing) evaluations.

Figures 3-6 display 1983-84 Montana Chapter 1 NCE gains in relation to Montana NCE averages for 1980-83, and national NCE averages for 1980-82. In the figures, confidence bands are constructed around the '83-'84 NCE gains (see inset). These bands are needed only for the most current data (1983-84). The large number of students aggregated in the previous Montana and national results reduces the potential error to essentially zero.

COMPARING LOCAL GAINS TO STATE AND NATIONAL GAINS[1]

(FALL-SPRING TESTING SCHEDULE)

1. Compute local gains for each grade level in reading and math.

   A student must have both a pretest and posttest score if his/her data are to be averaged.

   a. Count the students for whom you have both a pretest and posttest score; this number, N, is used to compute averages for this grade and subject and refer to the "Give or Take" table below.

   b. Total the pretest NCE scores; similarly, total the posttest NCE scores.

   c. Find the averages by dividing each total by N.

   d. Compute the gain by subtracting the average pretest NCE from the average posttest NCE.

2. Graph the NCE gains and confidence bands for each grade on the appropriate reading and math graphs at right.

   a. Using the N computed above, look up the appropriate "+/-" value in the "Give or Take" table.

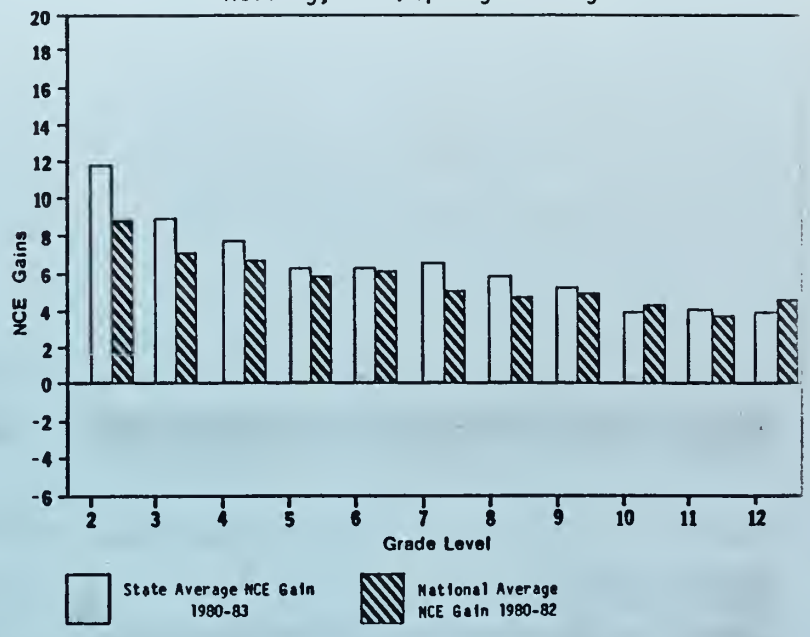
   b. Add and subtract this value from the NCE gain to form the confidence band for interpreting gains at each grade and subject matter. Shade this area in each graph.

3. Compare the NCE gains for your project with the state and national NCE gains at each grade level already shown. Include the confidence bands in making these comparisons.

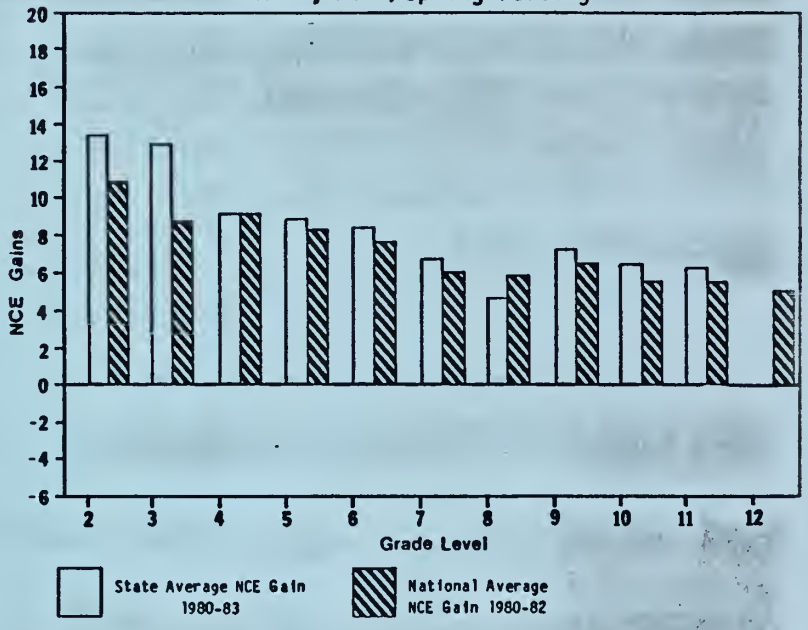
   a. Are there grade levels at which your data are higher than the state and national gains? Are there grade levels at which your data are lower than state and national gains?

   b. What implications does this information have for your Chapter 1 program?

Chapter 1 NCE Gains
Reading, Fall/Spring Testing



Chapter 1 NCE Gains
Math, Fall/Spring Testing



"Give or Take" Table

N	+/-	N	+/-	N	+/-
1	12.0	11	3.6	21	2.6
2	8.5	12	3.5	22	2.6
3	6.9	13	3.3	23	2.5
4	6.0	14	3.2	24	2.4
5	5.4	15	3.1	25	2.4
6	4.9	16	3.0	26	2.4
7	4.5	17	2.9	27	2.3
8	4.2	18	2.8	28	2.3
9	4.0	19	2.8	29	2.2
10	3.8	20	2.7	30	2.2

[1] For more information on using confidence bands, consult Linda Thompson of OPI (1-800-332-3402) or Ray Gabriel of NWREL TAC (1-800-547-6339)

CONFIDENCE BANDS: "GIVE OR TAKE" IN INTERPRETING NCE GAINS

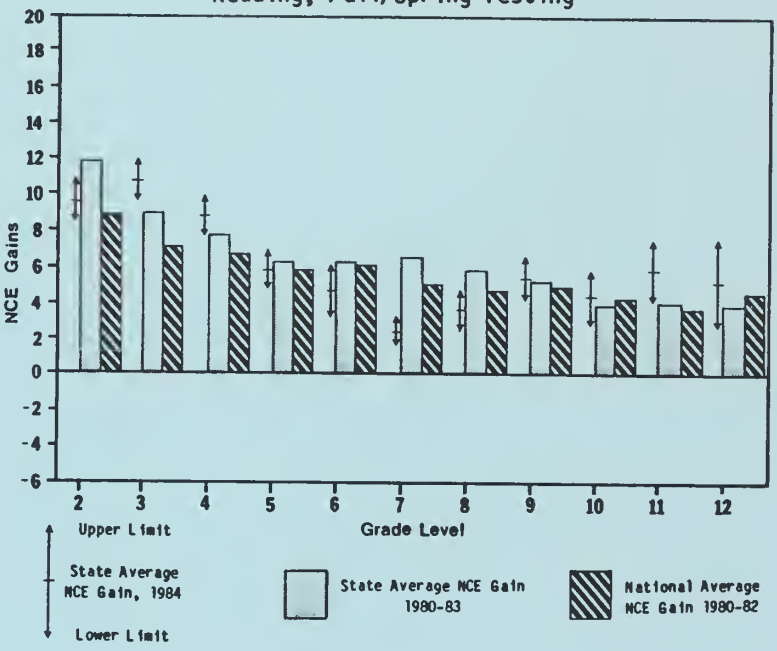
While standardized test scores are very good indicators of student achievement, they are by no means perfect. A student's performance on a test may be influenced by motivation, occasional distractions and guessing. None of these really have anything to do with the knowledge being tested. When we average students' test results over a large group of students, these factors tend to balance out. That is, they raise scores as often as they lower them. For a single student, or a small group of students, however, we are less sure this happens. These factors affect our confidence in interpreting test scores. Fortunately, test theory and research allows us to estimate how much the test results are affected by these factors. A "give or take" factor can be calculated for these test scores, and a confidence band drawn around the observed test score based on this "give or take" value. This has been done in the displays of the 1983-84 Chapter 1 NCE gains in this report. For example, the "give or take" factor for the average grade 2 Reading NCE gains on a fall/spring testing schedule (see Figure 3) is about 1 NCE. The average gain of 9.7 NCEs at this grade is more accurately interpreted as falling somewhere between 8.7 and 10.7 NCEs.

Reading, Fall/Spring Testing

Evaluation results for 1983-84 Chapter 1 reading programs using a fall-spring testing schedule are displayed in Figure 3. The bar graphs at each grade level represent 1980-83 Montana results and 1980-82 national results. The typical pattern of declining gains across grade levels is evident in both cases. Notably, Montana's 1980-83 average gains exceed those in the national data in nine of the eleven grade levels, although sometimes the difference is very small. The 1983-84 results show a less consistent pattern across the grades. The highest gains are again in the early grades, but they decline to a low at grade 7, rising again into the high school years. These 1983-84 Montana scores are higher than national and 1980-83 state averages at grade 3, but lower than both at grades 7 and 8.

Figure 3

Chapter 1 NCE Gains
Reading, Fall/Spring Testing

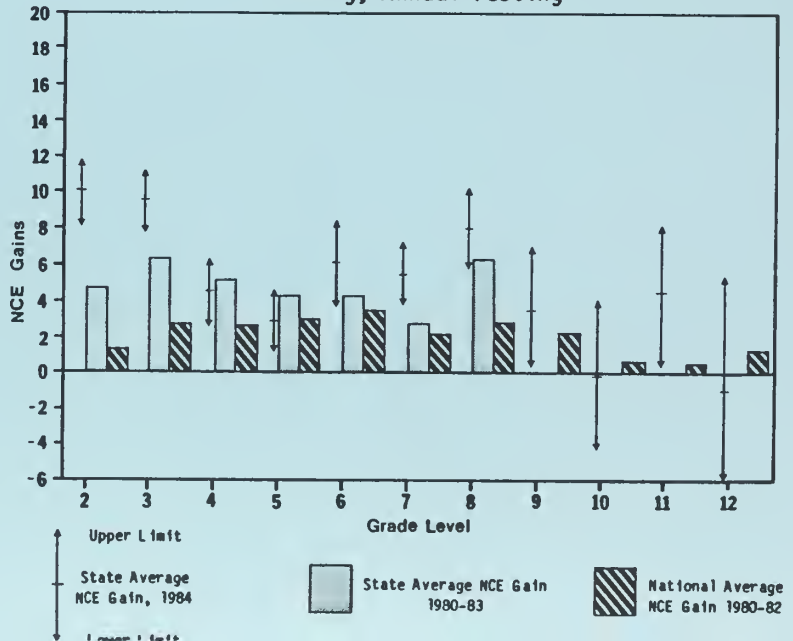


Reading, Annual Testing

The pattern of gains in reading programs is very different for those projects using an annual testing schedule, as shown in Figure 4. Gains are not at their highest in the early grades. They reach their peak at intermediate grade levels. Again, 1980-83 Montana averages exceed national averages at every grade through grade 8. There are no results displayed for the high school years because there are too few students in these programs to calculate stable statewide averages. Confidence bands on the 1983-84 high school data are much wider, reflecting the small number of students included in these totals. The 1983-84 gains are significantly higher than 1980-83 averages in the early grades and in the junior high years.

Figure 4

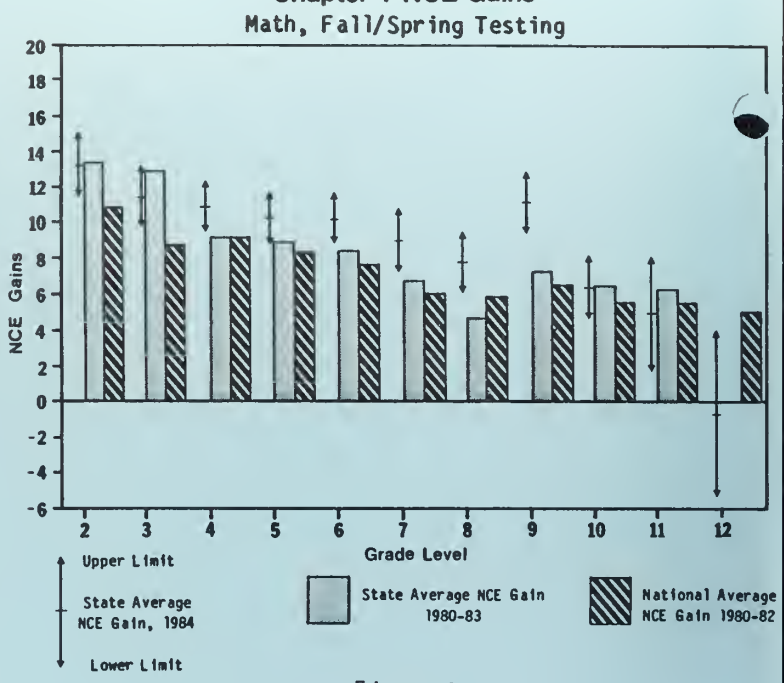
Chapter 1 NCE Gains
Reading, Annual Testing



Math, Fall/Spring Testing

Chapter 1 math programs using a fall/spring testing schedule show highest gains at the early grades, with a gradual decline as grade levels increase. Math gains are typically higher than reading gains at corresponding grades when tested on a fall-spring schedule. Montana's 1980-83 statewide average gains are higher than national averages at all but the eighth grade level. 1983-84 results exceed both state and national averages in grades 4 through 9.

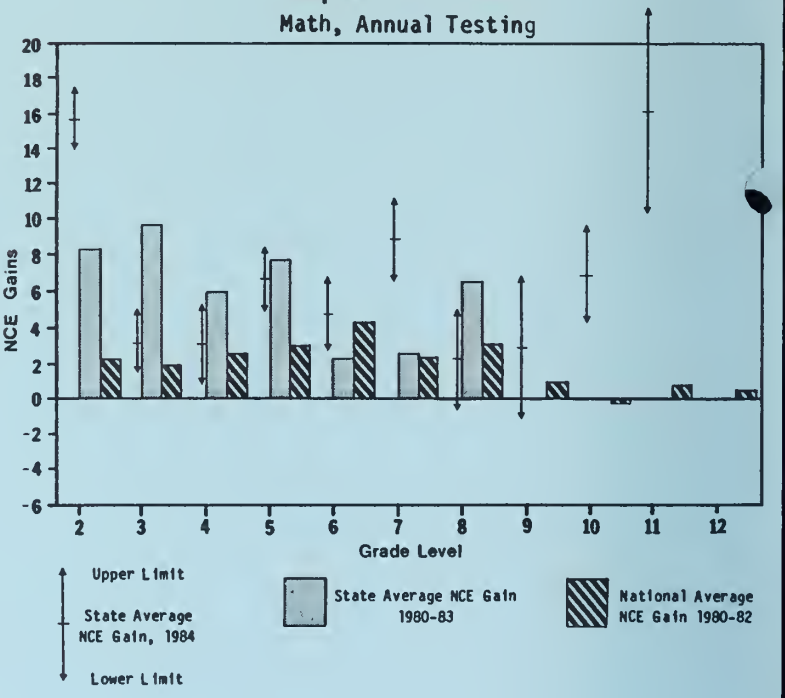
Figure 5



Math, Annual Testing

When compared to fall-spring evaluation results, annual testing schedules show a different pattern of results in math as well as reading programs. There are very few high school math programs using annual testing in Montana. This is shown by the absence of 1980-83 statewide averages in grades 9-12, and the wide confidence bands on the 1983-84 results. When there are so few programs and students, it is rare to find smooth patterns or trends. For example, 1983-84 NCE gains are highest at grade 2 but nearly the lowest at grades 3 and 4. Montana average gains for 1980-83 far exceed nationwide gains through grade 5, but are lower or roughly the same in grades 6 and 7.

Figure 6



Montana Chapter 1 educators can feel encouraged by these evaluation results. Students' achievement gains are positive, and statewide results equal or exceed national averages in nearly all instances. The patterns across grade levels or subject matters are fairly consistent in Montana and national data.

An evaluation comparisons worksheet is enclosed for your convenience. Compare your project's 1983-84 evaluation results with the state and national averages; remember to use confidence bands. Let us know what you think. It is hoped that this comparison provides interesting information which will be useful in reviewing, implementing and improving your current and future Chapter 1 programs.

This report was prepared by Chapter 1 staff of the Montana Office of Public Instruction and the Northwest Regional Educational Laboratory Chapter 1 Technical Assistance Center. Thanks to all of you involved in local Chapter 1 programs for providing accurate and timely evaluation information to us.